REMARKS/ARGUMENTS

The Applicants have studied the Office Action dated December 8, 2006, and have made amendments to the claims to distinctly claim and particularly point out the subject matter which the Applicants regard as the invention. No new matter has been added. It is submitted that the application, as amended, is in condition for allowance. By virtue of this amendment, claims 1-30 are pending. Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks is respectfully requested.

Double Patenting

The Examiner provisionally rejected Claims 1-2, 4-13, 15-22, and 24-30 under 35 U.S.C. 101 as claiming the same invention as specified claims of copending Application No. 09/915,907. The Applicants traverse this rejection based upon the additional features of the elements of independnent claims 1, 12 and 22 of the present application that are not present in the claims of application number 09/915,907. For example, the processing performed by the "validating" limitation of the present application's claim 1 is defined in further detail than that of the copending application. Since the independent claims of the present application distinguish over the claims of application number 09/915,907, the dependent claims, which include the limitations of the independent claims, distinguish as well.

The Applicants believe that these additional features have patentable weight and assert that the Examiner has not provided an explaination of why these additional features fail to deserve patentable weight. Additionally, the Applicants have amended the independent claims of the pending application to further distinguish these independnet claims from the invention claimed by application number 09/915,907. The Applicants therefore assert that the presently claimed invention distinguishes over patent application number 09/915,907, and that the provisional statutory double patenting rejection should be withdrawn.

Rejections - 35 USC § 102

The Examiner rejected Claims 1-2, 4, 6-13, 15, 17-23, 25-30 under 35 U.S.C. 102(e) as

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being anticipated by Wipfel et al., U. S. Patent Number 6,151,688 (hereinafter "Wipfel").

To begin, the Wipfel reference is directed towards monitoring and allocation of cluster nodes, cluster memory, and other cluster computing resources. Wipfel, col. 1, lines 12-14. Although Wipfel is generally directed to cluster resources, the processing described within the Wipfel reference is primarily directed towards monitoring the status of and connectivity between only the computing nodes and does not extend to monitoring the operation or status of data storage devices. As discussed below, the Applicants assert that the monitoring performed by the Wipfel system is not analogous to the processing set forth for the presently claimed invention.

The Applicants have amended claims 1 and 12 to more clearly define the presently claimed invention. Support for these amendments is found in the specification at, for example, paragraphs 0041, 0042 and 0046. No new matter has been added by these amendments. Using the limitations of claim 1 as an example, these claims include limitations corresponding to:

> configuring at least one data storage device for use by a node, wherein the node is associated with a site containing the data storage device;
> validating availability of the at least one data storage device for inclusion in a data storage resource pool, wherein the validating comprises determining that the node has access to the data storage device and verification that the at least one data storage device is located at the site; and
> selecting, based upon the validating, at least one of the at least one data storage device for inclusion in the data storage resource pool.

The Applicants assert that the Wipfel reference fails to teach the "validating" limitation, as amended, that is recited for claim 1. The teachings of the Wipfel reference are limited to determining accessibility of another node, not to determining "that the node has access to the data storage device" as is set forth for the present invention. The Brief Summary of Wipfel describes the failure processing of Wipfel to be performed "when a node or part of a system area network becomes inoperative." Wipfel, col. 4, lines 15-17 (emphasis added). Wipfel describes the "system area network" by stating "nodes 106 communicate through a system area network 110 using interconnects 112." Wipfel, col. 6, lines 23-24 and FIG. 1. As shown in FIG. 1 of Wipfel, the "storage media 124" is not a part of any node 106 or the "system area network 110."

Further, Wipfel describes the "probing" as including "a first node (denoted K) probes remote

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memory in a second node." Wipfel, col. 9, lines 35-37. Wipfel continues to describe a "probing node" that probes a "probed node," which is interchangeably referred to as a "probed device." See, Wipfel, column 10, lines 6-7, 13-34. Devices to be monitored by a "probing node" are identified as other nodes, communications "interconnects" and "system area network switch." The Wipfel reference then decribes probing nodes and inter-node communications devices as determining if the probing node "can still communicate with the remote device." Wipfel Col. 10, lines 37-38. Probing of these remote devices is then described as "remotely probing memory in a device (such as a remote node 106, an interconnect 112, or a switch 204)." Wipfel, col. 10, lines 42-44. Wipfel describes the servers as having access to the "shared disks 114 through a channel 116 which does not rely on the interconnects 112 to operate." Wipfel, col. 6, lines 40-41. In fact, Wipfel describes the "shared disk" as an alternative communications means to be used when a communications interconnect is detected. Wipfle, col. 13, lines 34-44.

The Applicants assert that the shared memory described in the Wipfel reference is memory, that may include buffers, that is part of a computing node that is used for inter-node communications and not for data storage. See, Wipfel, col. 8, lines 7-19. This shared memory is not analogous to a "data storage resource pool" as set forth for the presently claimed invention.

Further, with regards to the "validating" limitation of claim 1, there is no teaching in the Wipfel reference of "verification that the at least one data storage device is located at the site" as is further recited by this limiation of claim 1. The Examiner references a portion of Wipfel that teaches verifying access to a resource. Office Action dated December 8, 2005, page 5, first full paragraph (citing Wipfel, col. 9, line 64-col. 10, line 3). Wipfel, however, makes no mention of the location of the resource. As discussed above, the particular example given in the Wipfel reference, paraticularly in this cited portion, refers to probing another node or communication resource, but does not include a descrption of probing data storage devices.

With regards to the selecting limitation, as amended, the Wipfel reference does not teach selecting a data storage device for inclusion in to a data storage resource pool. The Applicants further assert that corresponding claim 12, as amended, similarly distinguishes over the Wipfel reference for all of the reasons stated above.

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The Applicants have amended claims 2, 13 and 25 to more clearly set forth this aspect of the present invention. Support for these amendments is found in the specification at, for example paragraph 0028. No new matter has been added by these amendments. Using claim 2 and an example, the Applicants respectfully point out that the term "switchable resource pool" is a term of art that is well known to ordinary practitioners familiar with the OS/400 operating system. The term "switchable resource pool" is clearly defined and repeatedly used in the Applicants' specification. The specification states: "Resource pools that are accessible by multiple nodes at a site are able to be configured as switchable resource pools so that the node hosting the operation of that resource can be switched to other nodes at the same site." Specification, paragraph 0028. Resource pools are further described as including a tower of disk units. Specification, paragraph 0032. The Wipfel reference does not teach or suggest the inclusion of switchable disk pools in the context of the present invention, which includes the "configuring," "validating," and "selecting" limitations set forth in claim 1. The Applicants assert that corresponding claims 13 and 25 similarly distinguish over the Wipfel reference for all of the reasons stated above.

With regards to claim 4, and corresponding claims 15 and 23, the Applicants reassert the above remarks with regards to the lack of a teaching by the Wipfel reference of the the of validating and selecting disk units. Claim 4 explicitly states "ranking availability of each disk unit..." and "selecting at least one valid disk unit..." in the context of the limitations of claim 1, from which claim 4 depends.

As a teaching of the "ranking availability" limitation of claim 4, The Examiner cites a portion of Wipfel that "probes remote memory locationed in a second node" to determine the availabilty of that second node. Wipfel, col. 9, lines 34-48. In order to improve this determination and to assist in troubleshooting, the second node is able to set this memory to "an unusual value (such as all zero bits or all one bits)." Wipfel, col. 9, lines 55-56. The Applicants fail to see where this cited portion, or any portion of the Wipfel reference, teaches or suggests "ranking availability of each disk unit," particulary in the context of the limitations of claim 1, from which claim 4 depends.

With respect to the "selecting" limitation of claim 4, the Examiner cites a portion of the Wipfel reference that the Examiner characterizes as "the method of selected the node by checking the activity of the remote node through a differnent communcation channel and determined the availability of the node." Office action dated December 8, 2005, page 5, last paragraph (citing Wipfel, col. 12, lines 6-20). The cited portion of the Wipfel reference describes processing performed by a node to troubleshoot a failed remote node by attempting to read remote memory from "different devices in the communicaiton path." Wipfel, col. 12, lines 5-7. Such fault isolation includes:

> For instance, if a register 402 (containing a counter 508 or containing some other value) can be read but a page 404 of shared memory 220 in the remote node 106 cannot be read, then condition 324 (node hardware crashed but interconnect works) is likely. If the interconnect register 402 cannot be read, then either condition 326 (interconnect failed) or condition 328 (interconnect and/or node failed) is present. By checking for continued activity by the remote node 106 through a different communication channel, such as the backup link 206 or the shared disk 114, the probing node 400 may determine either that the interconnect 112 and remote node 106 have both crashed or that the interconnect 112 is down but the remote node 106 is still running.

Wipfel, col. 12, lines 8-20. Again, the Applicants fail to see in this quotation a teacing of any type of "selecting" or any reference to a "disk unit" as is set forth by this limitation. As is clear from the above quotation, this portion of Wepfel only discusses determining the status of a remote node and isolating a detected failure to the node, shared memory, or a communicaitons link. The Applicants assert that corresponding claims 15 and 23 similarly distinguish over the Wipfel reference for all of the reasons described above.

The Applicants have amended claims 7 and 26 to further specify that "the cluster resoruce group comprises a primary node and at least one backup node, wherein the primary node and the at least node backup node execute the OS/400 operating system and the data storage resource pool is defined as an independent auxiliary storage pool." Support for these amendments is found in the specification at, for example, paragraphs 0033 and 0036. No new matter has been added by these amendments. The Applicants submit that this aspect of the present invention, when considered in the context of combining the limitations from which these claims depend in an OS/400 environment operating with independnet auxiliary storage pools (IASPs), is not found or suggested in the prior art:

With regards to claim 8, and corresponding claims 18 and 27, the Examiner cites a portion of the Wipfel reference that states "the new node 106 must typically be given access to the shared disk 114 and a chance to request sharable resources 222 from the pool 212." Wipfel, col. 8, lines 57-59. The Applicants fail to see where the cited portion of Wipfel, or anywhere in the Wipfel reference, teaches or suggests the claimed limitations of:

> validating accessibility of data storage devices in the data storage resource pool when adding a new node to a cluster resource group recovery domain, wherein the validating comprises
>> determining that the node is associated with a site containing the data storage resource pool
>> and
>> determining that the data storage resource pool is accessible by the new
> node.

Wipfel does not teach or suggest any validation of a data storage device at any time, including "when adding a new node to a cluster resoruce group" as is set forth by claim 8. Furhter, the Wipfel reference does not teach or suggest determining "that the node is associated with a site containing the data storage resource pool" as is set forth by claim 8. The Applicants assert that corresponding claims 18 and 27 similarly distinguishes over the Wipfel reference for all of the reasons described above for claim 8.

With regards to claim 9, and corresponding claims 19 and 28, the Applicants assert that the Wipfel reference does not teach or suggest "verifying accessibility of each resource in the switchable data storage resource pool by each node in the cluster resource group recovery domain" as is set forth by these claims. Wipfel discusses shared disks that is accessible by a subset of nodes in a cluster, but does not describe a "data storage resource pool" that is accessible by each node of the cluster.

With regards to claim 10, , and corresponding claims 20 and 29, the Examiner cites a portion of the Wipfel reference that describes that a failure in one or more of the interconnections or system area netowrk swithces, or in a remote device will make the remote memory inaccessible and unavailable. Wipfel, col. 11, lines 63-68. (as cited in the Office Action dated December 8, 2005, page 7, last paragraph through page 8, first paragraph. The Applicants fail to see where in the

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cited portion of the Wipfel reference, or anywhere in the Wipfel reference, there is a teaching of "verifying that a switchable entity containing the switchable data storage resource pool is not included in another cluster resource group" as is set forth for claim 10. The Applicants assert that corresponding claims 20 and 29 similarly distinguish over the Wipfel reference.

The Applicants have amended claim 11, and corresponding claims 21 and 30, to more clearly recite this aspect of the presently claimed invention. As discussed above, the term "switchable resource pool" is known in the art. The Applicants have amended these claims to more clearly recite that the processing performs "validating, when starting clustering, switchability of the switchable data storage resource pool between at least two nodes within the cluster resource group." Support for these amendments is found in the specification at, for example, paragraph 0028. No new matter has been added by this amendment. The Applicants assert that the Wipfel reference does not teach or suggest the performance of any type of "validating ... switchability" for a data storage resource pool, as is set forth by claim 11, particularly in the context of the limitations of the claims from which it depends.

With further regards to claim 11, the Applicants asser that the Wipfel reference fails to discuss any processing to be performed "when starting clustering" as is set forth for the validating limitation of claim 11. The Wifel reference discusses starting and restarting individual nodes of a cluster, but does not discuss any processing to be performed to start a particular cluster. The Applicants assert that corresponding claims 21 and 30 similarly distinguish over the Wipfel reference for all of the reasons described above for claim 11.

The Applicants have amended claim 22 to more clearly recite this aspect of te presently claimed invention. The processor of claim 22 is now described as "configured to validate availability of the at least one disk unit for the data storage resource pool." The Applicants assert that the Wipfel reference does not teach this limitation.

The Applicants traverse the Examiner's assrtion that the Wipfel reference teaches "the availability is validated based at least in part on the at least one data storage resource being located at the site." Office Action dated December 8, 2005, page 9, last paragraph (citing

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Wipfel, col. 13, lines 35-44). The cited portion of Wipfel describes using a shared disk as an alternative communications path between two nodes. Wipfel, col. 13, lines 35-44. The Applicants assert that the only portion of Wipfel that discusses any type of determining if a node is suitable for any purpose describes a "role field" table entry that indicates if a node is suitable for service as a cluster master or has other characteristcs. Wipfel, col. 14, lines 26-29.

With further regards to claim 22, the Applicants assert that the Wipfel reference, and in particular the cited portion of Wipfel, does not teach or suggest any type of processing that validates availability of a disk unit "based at least in part on the at least one <u>disk unit being located at the site</u>" as is set forth for claim 22.

Rejections - 35 USC § 103

The Examiner rejected Claims 3, 5, 14, 16 and 24 under 35 U.S.C. 103(a) as being unpatentable over Wipfel et al, U. S. Patent No. 6,151,688 (hereinafter "Wipfel") in view of Norwood, U. S. Patent No. 5,983,316 (hereinafter Norwood).

To begin, the Norwood reference is directed to management of a storage pool, including monitoring physical links to physical volumes. Norwood, abstract. The Applicants assert that "geographically disperse computer system groups" are not even contemplated by this reference.

With respect to claims 3 and 14, the Applicants traverse the Examiner's assertion that the Norwood reference teaches "the node operates as part of <u>a geographically disperse</u> computing system <u>group</u>" as is set forth by these claims. The Examiner cites figure 1 of Norwood as a teaching of this limitation. Office Action dated December 8, 2005, page 12, second full paragraph (citing figure 1). Norwood describes its figure 1 as "a block diagram of a high availability computer system. A node 71 and a node 72 each accesses disk storage 73." Norwood, column 3, lines 53-55. Norword states that both of "node 71" and node "72" access each of a plurality of disk storage elements through two data communications busses. These data communications busses are defined as "Small Computer System Interface (SCSI)." As is very well known in the art, a SCSI bus has a very short range. For example, a listing of different versions of SCSI specifications define a maximum cable length to be between 1.5 to 25 meters.

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As both nodes of figure 1 of Norwood connect to all disk storage elements through SCSI interfaces, the separation of these two nodes is limited to, at most, 50 meters. The Applicants submit that 50 meter separation does not constitute a "geographically disperse computing system group" as is set forth by these claims. Further, the Applicants' specification describes that the "different geographic sites" of the "geographically disperse computer system are generally interconnected with a data communications system that support data exchange among all of the sites and the computer nodes located at those sites." Specification, paragraph 0009.

The Applicants assert that a proper rejection under 35 U.S.C. §103 requires that the invention be considered, according to the statute, "as a whole." Using claim 1 as an example, the invention as set forth in claim 3 includes elements set forth in claim 1 that verify, for example, "that the at least one data storage device is located at the site." The Applicants assert that a proper consideration of claim 3 "as a whole" should include processing for this limitation that also comprehends the "geographically disperse computer system" set forth in claim 3.

With respect to claim 5, and corresponding claims 16 and 24, the Applicants traverse the Examiner's assertion that the Norwood reference teaches "providing at least one reason to a user to explain validity and ranking of each disk unit." The Examiner correctly states that Wipfel fails to teach this limitation. Office Action dated December 8, 2005, page 12, first paragraph of section 42. The Examiner cites figure 7 of Norwood as a teaching of this limitation. Office Action dated December 8, 2005, page 12, last full paragraph. Figure 7 of Norwood only describes displaying a list resources classes 41, and a list of resources names 43 that are included in a particular resources class that the user selects from the list of resources classes 41. The user is able to select a particular resources name frwom within the resources names list 43, which causes the information contained in figure 8 to be displayed. Norwood, col. 8, lines 13-40. Figure 8 only displays poling configuration information for the resource, an not any information to "explain validity and ranking of each disk unit" as is specified for claims 5, 16 and 24. The Applicants assert that no section of the Norwood reference teaches or suggestes displaying any information to "explain validity and ranking of each disk unit."

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CONCLUSION

The foregoing is submitted as full and complete response to the Official Action mailed December 8, 2005, and it is submitted that Claims 1-30 are in condition for allowance. Reconsideration of this application in light of this amendment and the above comments is requested. Allowance of Claims 1-30 is earnestly solicited.
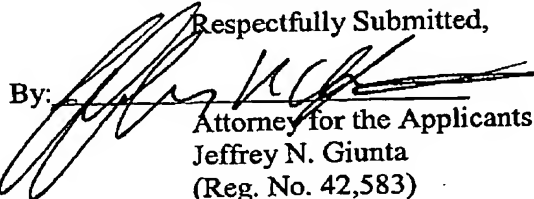
No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicants acknowledge the continuing duty of candor and good faith to disclosure of information known to be material to the examination of this application. In accordance with 37 CFR § 1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicants and their attorneys.

Applicants respectfully submit that all of the grounds for rejection stated in the Examiner's Office Action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in condition for allowance, which allowance is respectfully requested.

PLEASE CALL the undersigned if that would expedite the prosecution of this application.

Respectfully Submitted,

Date: March 8, 2006

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